



UNIT 2 - FUELS

SECTION 3 - WHAT ARE ALTERNATIVE FUELS?



CONCEPT MAPPING ALTERNATIVE FUELS

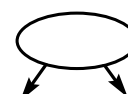
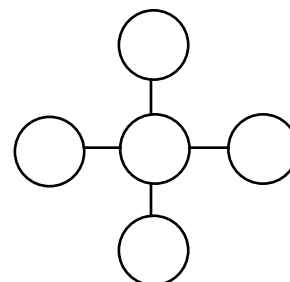
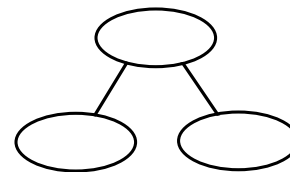
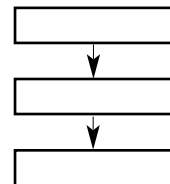
Background Information

A concept map is a way of representing relations between ideas, images or words, in the same way that a sentence diagram represents the grammar of a sentence, a road map represents the locations of highways and towns, or a circuit diagram represents the workings of an electrical appliance.

In a concept map, each word or phrase is connected to another and linked back to the original idea, word or phrase. Concept maps are a way to develop logical thinking and study skills, by revealing connections and helping students see how individual ideas form a larger whole.

Concept maps are flexible. They can be made simple or detailed, linear, branched, radiating, or cross-linked.

- Linear concept maps are like flow charts that show how one concept or event leads to another.
- Hierarchical concept maps represent information in a descending order of importance. The key concept is on top, and subordinate concepts fall below.
- Spider concept maps have a central or unifying theme in the center of the map. Outwardly radiating sub-themes surround the main theme. Spider concept maps are useful for brainstorming or at other times when the relationships between the themes need to be left open-ended.
- Cross-linked maps use a descriptive word or phrase and identify the relationship with a labeled arrow.



**CONCEPT MAPPING ALTERNATIVE FUELS
INVESTIGATION CONT.**

What Are Alternative Fuels? introduces fuels for vehicles other than the petroleum-based fuels now in conventional use. These alternative fuels include biodiesel, ethanol, hydrogen, methanol, natural gas, and propane.

In this activity you will create a concept map comparing and contrasting alternative fuels.

Problem *(fill in problem):* _____

Materials

1 large piece of paper
markers

"Alternative Fuels and Their Characteristics" (Appendices, pp. 412 - 413)

Procedure

1. The first step in creating a concept map is to decide on a main topic or idea, print it in the middle of the page, and draw a shape around the words. The main topic in this lesson is alternative fuels.
2. Read "Alternative Fuels and Their Characteristics." Look for ways that you can compare and contrast the fuels. Some examples of classification schemes are: chemical class (e.g., paraffins, alkanes, alcohols), substance type (e.g., mixture, compound, element), phase (gas, liquid) and source (biofuels, fossil fuels, synthesized fuels). Refer back to the concept map you created on "Fuels for Everything." The classification schemes are similar to the major concepts you used in that lesson.
3. Using a cross-linked technique, draw a short line down from the shape that contains the words Alternative Fuels. Write the first classification scheme at the bottom of the line. Draw another short line going down for each classification e.g., paraffin, alcohol, element.
4. Draw a shape around each classification. Draw another short line going down.
5. Follow this same procedure for each of the classification schemes.

**CONCEPT MAPPING ALTERNATIVE FUELS
INVESTIGATION CONT.****Observations**

1. Compare and contrast diesel and reformulated gasoline to liquefied natural gas, compressed natural gas, and propane. _____

2. Compare and contrast syngas, biogas, and methanol. _____

3. Compare and contrast hydrogen and methanol. _____

4. Compare and contrast ethanol and methanol. _____

Application

The background information included three ways to make a concept map besides the linear technique. They were: branched, hierarchical and cross-linked. Concept maps can also include pictures instead of words or phrases. Pick one different type of mapping and create a new concept map.